UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/632,322	08/01/2003	Munenori Oizumi	TI-35909	5221

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EXAMINER
ROSARIO, DENNIS

ART UNIT	PAPER NUMBER
2624	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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		Application No.	Applicant(s)
Office Action Summary		10/632,322	OIZUMI ET AL.
		Examiner	Art Unit
		Dennis Rosario	2624

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS,
WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _06 February 2008_.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-5_ is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-5_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _01 August 2003_ is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

DETAILED ACTION

Response to Amendment

1.   The amendment was received on 2/6/08. Claims 1-5 are pending.

Response to Arguments

2.   Applicant's arguments on pages 3-5 of the remarks filed 2/6/08 have been fully

considered but they are not persuasive.

        Regarding page 3 that state that the applicants disagree with the

combination of Tourtier and Garakani and Burl. The examiner respectfully

disagrees as described in the following paragraphs, below.

        Regarding page 4, that states that Tourtier does not teach the last

limitation of claim 1 and especially interpolating each pixel that depends on a

modified auto-correlation in a first direction.

The examiner agrees in part, since Tourtier teaches all limitations of (c) except for the adjective of "modified auto-correlation" or "modified auto-." Tourtier teaches interpolating said image (via fig. 5,num. 6 that is an "interpolating filter" in col. 6, lines 46-50 in addition to being a "low-pass filter" in col. 5, lines 57-63) and said filtered lowpass image (via fig. 5, num. 7 that is a second interpolating filter that receives a low-pass filtered and interpolated image from fig. 5,num. 6 since fig. 5,num. 6 is a lowpass filter and interpolator) wherein said interpolating (fig.5 numerals 6 and 7) at said each pixel (as represented in fig. 3: "Pixels") depends (since fig. 5,numerals 6 and 7 in the broadest interpretation of the claimed "depend" require fig. 5,num. 1, because without fig. 5,num. 1 an open circuit would be present thus rendering fig. 5, numerals 6 and 7 with no current to execute low-pass filtering and interpolation) upon said correlation (as calculated in fig. 5,num. 1 that uses a "correlation calculation" in col. 1, line 64 to col. 2, line 1 that teaches a method of fig. 5,num. 1 as background information) in a first direction (as shown by a "Motion Vector" in fig. 3). Thus, the only missing limitation not addressed by Tourtier is the adjective of "modified auto-correlation" or "modified auto-." Since Tuortier teaches that fig. 5, num.1 is background information which suggests that there are other teachings of fig. 5,num. 1 or motion compensation that can be used to arrive at the "Motion Vector" of fig. 3.

Thus, the examiner applied Garakani and Burel and Tourtier in order to fill in the background teachings of fig. 5, num. 1 of Toutier that uses correlation to include the adjective or "modified auto-" of "modified-auto correlation" using the teaches of Garakani and Burel. Thus, fig. 5, numerals 6 and 7 which are interpolation filters broadly depend on fig. 5, num. 1 modified with modified auto-correlation since without fig. 5, num. 1, the interpolation of fig. 5, numerals 6 and 7 would not be possible due to fig. 5, num. 1 acting as an open thus creating an open circuit that would disable fig. 5, numerals 6 and 7. Thus, fig. 5, numerals 6 and 7 broadly need fig. 5,num. 1 and in effect the modified auto-correlation since fig. 5, num. 1 calculates the modified auto-correlation in order for fig. 5, numerals 6 and 7 to operate.

Or in general fig. 5,numerals 6 and 7 depend on preceding operations in fig. 5, such as input signal "4", filters 4 and 5, and motion compensation 1 and unlabeled oversamplers, because without the preceding operations the invention of Tourtier can not operate properly or as intended.

The dependability in the context of Tourtier uses a "sub-sampling factor" in col. 2, lines 3- 9 that uses as a "basis" in col. 2, lines 5-9 motion vectors. Thus, the sub-sampling factor such as fig. 5, num. 6 that uses the LL band as a sample "2" in fig. 1 uses as a basis for or depends on the motion vector which in turn requires a correlation calculation since without the correlation calculation the motion vector would not be computed and thus motion compensation which requires the motion vector would not be computed for fig. 1, num. 2 and would result in deterioration of quality of an image as discussed in col. 1, lines 49-59.

Regarding page 4 that Garakani does not teach the last limitation of claim 1, the examiner agrees in part since Garakani only teaches the "autocorrelation" in paragraph [0132] portion of "modified auto-correlation" and provides a reasonable combination with Tourtier, since Garakani uses auto-correlation to obtain a vector and Tourtier uses correlation to obtain a vector.

Regarding page 4 that Burel does not teach the last limitation of claim 1, the examiner agrees in part since Burel only teaches "modified auto-correlation" to describe "movements" in col. 3, line 42 and provides a reasonable combination with Garakani, because Garakani states that other functions of autocorrelation are known as discussed in [0132] for motion compensation.

Regarding page 5 that states that the combination would not have been obvious to modify Toutier's correlation to a find a vectot with Garakani's vector found using autocorrelation with Burel's autocorrelation to teach the last limitation of claim 1 of interpolating a pixel (as done in Tourtier in fig. 3 that describes "interpolation" in col. 2, lines 52-55) depends on a modified auto-correlation (since Tourtier teaches that the sub-sampling factor corresponding to fig. 5,num. 6 and 7 uses as a basis the motion vector as computed in fig. 5, num 1 and indirectly the correlation calculation to compute the motion vector. Thus, Tourtier implies that any correlation calculation within fig. 5,num. 1, such as Burel's modified autocorrelation, indirectly serves as a basis for the sub-sampling factor or fig. 5,numerals 6 and 7) in a first direction (as shown in fig. 3 as a "Motion Vector" in Tourtier and horizontal line "a" and vertical line "b" in Burel's fig. 3).

Claim Rejections - 35 USC § 103

3.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4.   Claims 1 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tourtier et al. (US Patent 5,446,495) in view of Garakani et al. (US Patent Application Publication No.: US 2003/0185450 A1) further in view of Burel et al. (US Patent 5,321,771).

Regarding claim 1, Tourtier teaches a method of image filtering, comprising:

(a)   computing a correlation (via fig. 5,num. 1 is based on a

"correlation" in col. 1, line 64 to col. 2, line 1 that computes a motion vector. Thus,

correlation has to be computed with consideration a direction of the motion vector) in a

first direction (corresponding to an associated "motion vector" in col. 4, line 38 that

includes a direction known to one of ordinary skill in vectors) for each pixel (fig. 3:

"Pixels") in an image (represented as the output of fig. 5,num. 1);

(b)   filtering (via fig. 5,num. 6) said image (output of fig. 5,num. 1) with a

lowpass filter ("low-pass" in col. 5, line 55 which corresponds to fig. 5, num. 6); and

(c)   interpolating (via fig. 5, numerals 6 and 7 which are also an

"interpolation filters" in col. 6, line 49 and lowpass filters) said image (output of fig.

5,num. 1 that is interpolated with fig. 5,num. 6) and said filtered image (represented as

the output of fig. 5,num. 6 that is interpolated with fig. 5,num. 7) from step (b) (or the

output of fig. 5, num. 6) wherein said interpolating (via fig. 5, numerals 6 and 7) at said

each pixel depends (since said interpolations 6 and 7 are based said fig. 5,num. 1 or

have a "basis" in col. 2, lines 5-9 with fig. 5,num. 1's output or motion vector) upon said

correlation in a first direction (or said motion vector as determined in fig. 5,num. 1 that

represents the product of the correlation that has to consider a direction of the motion

vector in order to create the motion vector since a vector includes magnitude and

direction known to one of ordinary skill in the art of vectors).

Tourtier does not teach the claimed "modified auto-correlation," but teaches

using "correlation" in col. 2, line 1 to find a motion vector.

Garakani teaches using autocorrelation (corresponding to fig. 3,num. 302 that is equivalent to "autocorrelation" in paragraph [0131], line 11) to find a motion vector ("motion vectors" in [0190], line 1 and represented in fig. 3 as numeral 303. Note that in order to find a motion vector via the "Co-Locomotion Module" in [0186], autocorrelation is performed first because the motion vector or said co-locomition module that finds the motion vector "depends...on an attentive acquisition sub-system [as shown in fig. 3, numerals 304,307,209 and 301] " in [0189], lines 5,6 which in turn depends on autocorrelation as represented in fig. 3 as num. 302. Thus, ultimately the motion vector computed in fig. 3, num. 303 depends on autocorrelation in fig. 3, num. 302).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify Tourtier's teaching of correlation to find a vector with Garakani's teaching of finding a vector using autocorrelation, because Garkani's autocorrelation provides "automated detection...of the event of interest" in [0130], lines 26,27;thus, alleviating a "human observer" in [0130], line 1 from detecting an event of interest over an "18-day" in [0130], line 19 observation of the event of interest.

The combination of Tourtier and Garakani still does not teach the claimed "modified auto-correlation," but Garakani of the combination teaches that autocorrelation is "well known" in [0132], line 9 for ultimately obtaining a motion vector in fig. 3,num. 303.

Burel teaches the claimed "modified auto-correlation" in fig. 6: "Computation of the modified autocorrelation" for "various movements" in col. 3, line 42.

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify Garakani's autocorrelation of fig. 3,num. 302 coupled fig. 3,num. 303 that estimates a motion vector with Burel's modified autocorrelation for various meovements, because Burel's modified autocorrelation with movement is used to provide a "simpl[e]" in col. 7, line 42 classification which helps Garakani's goal of classifying moving objects using "classes (Garakani, [0112], line 5]."

Regarding claim 5, Garakani teaches:

(a)   said image is a color channel ("chromatic channel" in [0122], line 7) of a color image.

5.   Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tourtier

et al. (US Patent 5,446,495) in view of Garakani et al. (US Patent Application

Publication No.: US 2003/0185450 A1) further in view of Burel et al. (US Patent

5,321,771) as applied in claim 1, above, further in view of Burel (US Patent 5,321,771).

        Regarding claim 2, Tourtier of the combination teaches:

        a)   said image of step (c) (output of fig. 5,num. 1) replaced by said

interpolated image (via fig. 5,numerals 6 and 7) using said modified auto-correlation (or

correlation) in a first direction; and does not teach the claimed "modified auto-

correlation" and "first direction" but teaches correlation.

        Burel of the combination teaches the claimed "first direction" or "horizontal

correla-tion" in col. 3, lines 52, 53 and the remaining limitation of claim 2 of:

        a)   said first direction (said horizontal correlation) replaced by a second

direction ("vertical movement" in col. 3, line 54), said second direction perpendicular to

said first direction.

        It would have been obvious at the time the invention was made to one of ordinary

skill in the art to modify Tourtier's correlation with Burel's horizontal correlation which is

the claimed "modified auto-correlation" for the same reasons as claim 1, above.

6.   Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tourtier

et al. (US Patent 5,446,495) in view of Garakani et al. (US Patent Application

Publication No.: US 2003/0185450 A1) further in view of Burel et al. (US Patent

5,321,771) as applied in claim 1, above, further in view of Kim et al. (US Patent

5,544,658).

Regarding claim 3, Garakani of the combination teaches that autocorrelation is

well known.

Kim teaches "modified auto correlation" in col. 3, line 17 and claim 3 of

(a)   said modified auto-correlation ("modified auto correlation" in col. 3, line 17)

of step (a) of claim 1 is $Rxx(1)/(Rxx(0) + \delta)$ (see equation "(1)" in column 3 and equation

(9) in column 8) where $Rxx(.)$ is the auto-correlation function for the pixel values in an

interval about said each pixel and with the DC component removed (via fig. 5,num. 34),

and where δ is a parameter (or "variables" in col. 8, line 22).

It would have been obvious at the time the invention was made to one of ordinary

skill in the art to modify Garakani's teaching of auto-correlation with Kim's teaching of

the modified auto-correlation, because Kim's modified auto-correlation remedies the

deficiencies of auto-correlation with respect to "aliasing" in col. 3, line 9 or noise.

7.   Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tourtier et al. (US Patent 5,446,495) in view of Garakani et al. (US Patent Application Publication No.: US 2003/0185450 A1) further in view of Burel et al. (US Patent 5,321,771) further in view of Kim et al. (US Patent 5,544,658) as applied in claim 3, above, further in view of Hall et al. (US Patent 5,363,851).

     Regarding claim 4, the combination does not teach claim 4, but Garakani teaches that auto-correlation is well known.

     Hall teach a modified auto-correlation as shown in fig. 4, num. 60 and claim 4 of:

     a) $Rxx(1)/(Rxx(0) + \delta)$ (as shown in fig. 4,num. 60) exceeds a threshold (fig. 4,num. 68).

     It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify Garakani's teaching of auto-correlation with Hall's modified auto-correlation and threshold, because Hall teaching provides "accurate velocity estimation" in col. 2, line 12.

Conclusion

8.   **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

     A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dennis Rosario whose telephone number is (571) 272-7397. The examiner can normally be reached on 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Bella can be reached on (571) 272-7778. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Dennis Rosario/   /Matthew C Bella/
Examiner, Art Unit 2624   Supervisory Patent Examiner, Art
                                                 Unit 2624